

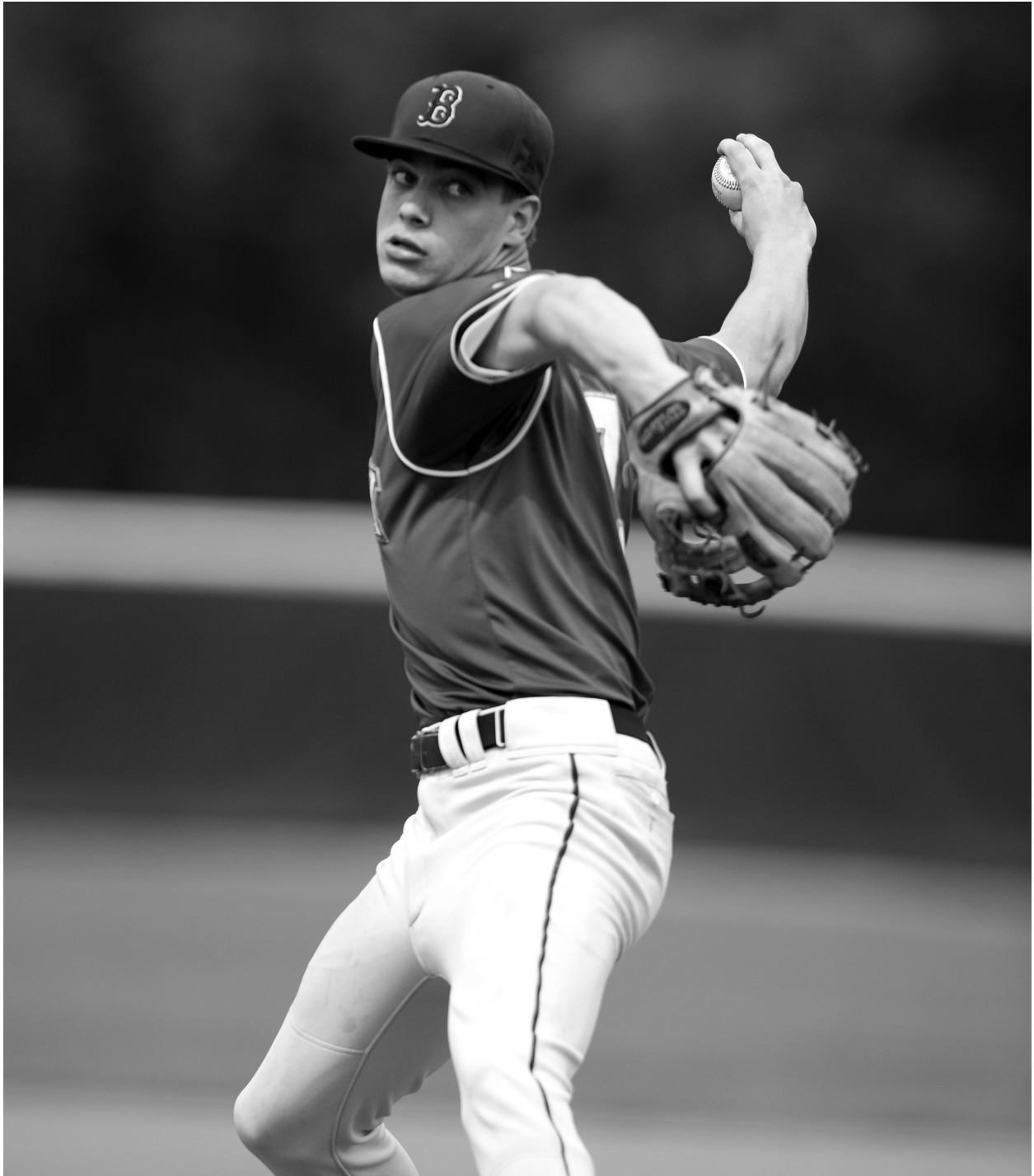


# **A Parent's Guide to Shoulder Injuries**



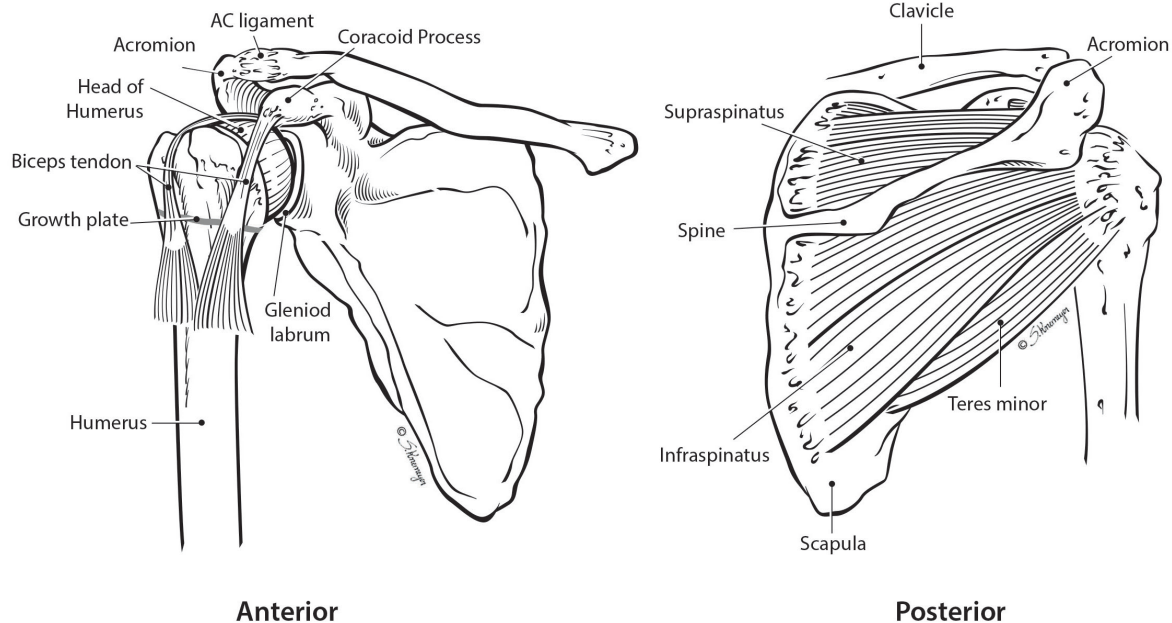
## Understanding Shoulder Injuries in Student-Athletes

Sports participation among recreational, competitive and elite athletes continues to grow, with over 25 million children and teens now participating in school-based sports and an additional 20 million in community-based youth sports programs. Increased participation brings an increase in sports-related injuries. An estimated 120,000 sports-related shoulder injuries occur in high school athletes each year, and shoulder surgeries account for about 10 percent of all surgeries performed on high school athletes.



## Anatomy of the Shoulder

The shoulder is a complex joint made up of bones, cartilage, ligaments and muscles. These all work together to create one of the most mobile joints in your body.



### Bones and Joints

The shoulder is made up of three bones — the collarbone (clavicle), the shoulder blade (scapula) and the upper arm bone (humerus). The collarbone is a long, S-shaped bone that runs across the top of the chest. The shoulder blade is a triangular-shaped bone on the back of the shoulder. These bones come together to form the shoulder joints.

### Cartilage

The labrum is a ring of cartilage on the outer edge of the shoulder blade. It helps to provide stability and cushioning to the shoulder joint.

### Ligaments

Ligaments attach bone to bone and provide stability to a joint. The ligaments of the shoulder work to protect the shoulder from forces from many directions.

An injury to a ligament is called a sprain. Sprains are classified into three grades. A first-degree sprain is mild and stretches the ligament. A second-degree sprain is a partial tear to a ligament. A third-degree sprain is a complete tear to a ligament and is the most serious ligament injury. When the ligament is completely torn, it no longer helps hold the two bones together.

### Muscles

Groups of muscles work together to allow the shoulder to move in multiple directions. Large muscles in the upper arm, chest and back move the joints of the shoulder. Four muscles on the back of the shoulder make up the rotator cuff and allow the shoulder to rotate. Muscles of the upper back help to raise, lower and rotate the shoulder blade. Muscle injuries or strains are classified in three grades, from a first-degree strain (mild) to a third-degree strain (severe).

# Traumatic Shoulder Injuries

The risk of traumatic shoulder injuries, such as dislocations, sprains and fractures, is highest in contact sports like football and wrestling. Sports requiring a lot of overhead movement, such as baseball, softball and volleyball, also carry a high risk for injuries of this nature.

## Shoulder Dislocation/Subluxation

Since the shoulder is so mobile, it can be very prone to dislocation (popping out of the joint). Shoulder dislocations and subluxations (a partial dislocation) account for about 25 percent of shoulder injuries in high school athletes.

### Signs and Symptoms of a Dislocation/Subluxation

Dislocations are caused by direct contact or a high amount of force placed on the shoulder during overhead movement. This type of injury produces significant pain and disability. The patient will likely be able to tell that their shoulder is out of place and the shoulder may appear flattened. A subluxation occurs when the top of the upper arm bone briefly moves out of place, but returns to its normal position on its own. The patient may report pain, popping or clicking, or feelings of instability.



### Expected Outcome

First-time dislocations will often be X-rayed prior to relocation to rule out a fracture. Then, a physician will put the shoulder back into place and immobilize it for a period of time. Rehabilitation to restore range of motion and strength are commonly required prior to returning to activity. Surgery may be necessary if a cartilage or bony injury also occurred or if repeated dislocations or subluxations occur.

## Collarbone (Clavicle) Fracture

The collarbone is a long, slender, S-shaped bone that lies very close to the skin's surface. For this reason, it is one of the most common sports-related fractures. Clavicle fractures can be caused by direct impact, falling onto the shoulder or falling on an outstretched arm. In student-athletes, the bone doesn't usually break all the way through.

### Signs and Symptoms of Clavicle Fracture

Pain, swelling or deformity can occur with clavicle fractures. The student-athlete will likely shy away from moving the arm on the affected side.

### Expected Outcome

X-rays will be taken and the patient may be put in a sling or brace for up to eight weeks to allow the bone to heal. Rehabilitation will help restore range of motion and strength prior to return to activity. Surgery may be needed if the fracture caused the bone to move significantly.



## Labrum Tear

A labrum tear can occur from falling on an outstretched arm, direct impact, excessive force being placed on the shoulder joint or as a result of dislocation/subluxation. Labrum tears are classified based on where the tear occurs and how serious it is.

### Signs and Symptoms of a Labrum Tear

A popping, clicking or catching sensation with pain can be felt in the shoulder. Episodes of instability with shoulder movement may occur as well. Range of motion and strength will likely be decreased.

### Expected Outcome

In active people, surgery is almost always required for serious labrum tears. Once the tear has been repaired, the patient will be in a sling for 4-6 weeks. After being removed from the sling, rehabilitation will be done to regain motion, strength and stability. Return to activity depends on the severity of the injury and how demanding the sport is. Patients usually return to sport activities in 4-6 months.

## Acromioclavicular (A/C) Joint Sprain

A/C joint sprains occur as a result of either a direct blow to the top of the shoulder or from falling directly onto the shoulder. Depending on the severity of the injury, the collarbone and top of the shoulder blade may separate, which is why this injury may also be referred to as a “separated shoulder.”

### Signs and Symptoms of an A/C Sprain

Classic symptoms of an A/C sprain include significant pain at the top of the shoulder that increases when the shoulder moves. Moving the shoulder across the front of the body will be especially painful. A visible or palpable divot or “step-off” deformity from the collarbone to the shoulder blade may be noticeable. Swelling around the injury site can also occur.

### Expected Outcome

A period of immobilization in a sling is normally required until pain and swelling decrease. Then, range of motion and strengthening exercises can begin, followed by a gradual return to sports. Surgery may be required if the ligament is partially or completely torn.



# Overuse Shoulder Injuries

Some student-athletes experience injuries to the shoulder muscles or ligaments because of repetitive motions associated with their sports. These types of injuries are common among athletes playing baseball, softball, tennis, volleyball or swimming.

## Rotator Cuff Strain

The rotator cuff is made up of a group of four muscles on the back of the shoulder that allow the shoulder to rotate and provide stability to the joint. Injury most often occurs when young athletes are repeatedly using an overhead motion in their sport.

### Signs and Symptoms of a Rotator Cuff Strain

Pain, weakness and loss of motion are most commonly associated with rotator cuff strains. Pain is usually worse when trying to perform overhead activities with the arm, such as throwing, spiking or swimming.

### Expected Outcome

Rotator cuff strains can usually be treated with a period of rest to allow the muscle to heal, followed by rehabilitation and gradual return to play. Rehabilitation typically involves stretching, strengthening and stabilizing the shoulder joint. If the rotator cuff is completely torn, surgery is required to repair the damaged muscles and tendons.



## Little League Shoulder

Little League Shoulder is an injury to the growth plate in the long bone of the upper arm. This is seen in athletes who are not yet skeletally mature and are using repeated overhead motions in their sport or playing multiple sports that require different types of overhead motion.

### Signs and Symptoms of Little League Shoulder

Patients commonly complain of pain during activity or at rest, shoulder weakness and loss of motion. The injury may also cause swelling.

### Expected Outcome

Little League Shoulder is easily diagnosed by X-ray. A period of rest is crucial to allow the bone to heal. Rest is followed by rehabilitation and a supervised, gradual return to sports. During the rehabilitation and return-to-play period, student-athletes should be taught and evaluated for proper throwing mechanics.

## Multidirectional Instability (MDI)

Multidirectional Instability (MDI) of the shoulder is looseness or lack of control in multiple directions of motion. There are many causes, but MDI can be related to overuse, muscle weakness, poor neuromuscular control or a previous traumatic injury, such as a dislocation.

### Signs and Symptoms of MDI

Common symptoms associated with MDI are pain in either the front or back of the shoulder, loss of motion, popping and clicking in the joint or numbness that creates a “dead arm” sensation.

### Expected Outcome

Conservative care for MDI includes rehabilitation to strengthen the shoulder muscles and improve neuromuscular control. Braces may be used for a period of time depending on the severity of the injury and activity status of the patient. If conservative treatment is unsuccessful, surgery may be needed.

## Impingement Syndrome

Impingement syndrome is the compression of multiple structures of the shoulder. Repeated overhead motions, such as throwing, spiking and swimming, can cause these structures to become irritated or inflamed.

### Signs and Symptoms of Impingement Syndrome

Patients will commonly complain of pain in the front of the shoulder, especially with overhead motions. Some muscle weakness and loss of motion can also occur.

### Expected Outcome

Impingement is commonly treated with rehabilitation, which may include activity modification, increasing neuromuscular control, mechanics training and strengthening of the shoulder, abdominal and lower extremity muscles.

## Bicipital Tendonitis

Baseball pitchers, tennis players and volleyball athletes all put a large amount of strain on the biceps muscle tendon with repetitive overhead actions. This can cause the tendon to become irritated, which can be very painful.

### Common Signs and Symptoms of Bicipital Tendonitis

Patients who have bicipital tendonitis will complain of pain in the front of the shoulder and focused tenderness over the biceps tendon. There also may be swelling, popping/clicking and pain with overhead movement.

### Expected Outcome

Activity modification or rest, along with rehabilitation that includes progressive stretching and strengthening, are very often successful treatments. Ice, non-steroidal anti-inflammatory drugs (NSAIDs) or other modalities may also be useful in treating bicipital tendonitis.



# General Treatment Recommendations for Shoulder Injuries

## Shoulder Injury Prevention

Proper conditioning, including a complete warm up that incorporates dynamic (moving) stretching, can help decrease the risk of shoulder injuries. The best time to work on flexibility is after a workout. Static (still) stretches should be held for at least 30 seconds. In addition, a strengthening program that includes lower extremity, core and upper extremity exercises are an important part of shoulder injury prevention. Always increase workout demands — including sets, repetitions, weight, time and distance — gradually to allow the body to adjust. Finally, proper technique and form in throwing, spiking, swimming and tackling should be taught at practices.

## Treatment Considerations

Ice and anti-inflammatory medication can help reduce both swelling and pain. Cold packs should be applied for 10-15 minutes every 2-3 hours. A sling may be recommended for comfort and immobilization. Home exercises to work on range of motion, stretching and strengthening may be prescribed by an athletic trainer, physician or other medical professional, or the athlete may be referred for formal rehabilitation.

## Medication

Any medication should be taken under the direction of a physician. Most suggest non-steroidal, anti-inflammatory medications, such as ibuprofen, or other minor pain relievers, such as acetaminophen. Ibuprofen should not be taken for seven days before surgery. If any bleeding, stomach upset or signs of allergic reaction occur, contact a physician.

## Resources

1. Krajnik S, Fogarty KJ, Yard EE, Comstock RD. Shoulder injuries in U.S. high school baseball and softball athletes, 2005–2008. *Pediatrics*. 2010, 125(3):497-501.
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4. Dashe J, Roocroft JH, Bastrom TP, Edmonds EW. Spectrum of shoulder injuries in skeletally immature patients. *Orthopedic Clinics of North America*. 2013, 44(4):541-551.
5. Arnheim DD, Prentice WE. Principles of Athletic Training: A Competency-Based Approach. 2010. McGraw-Hill: Boston.





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